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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,088	11/14/2003	Ian M. McMackin	P69/MII-29-11-03	9507

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PO BOX 81536  
AUSTIN, TX 78708-1536

EXAMINER
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PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

<b>Office Action Summary</b>	<b>Application No.</b> 10/714,088	<b>Applicant(s)</b> MCMACKIN ET AL.	
	<b>Examiner</b> Marianne L. Padgett	<b>Art Unit</b> 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1762

1. Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While applicants' amendments have corrected the problem of the preambles not being commensurate in scope with the bodies of the independent claims, the confusion concerning "unit volume associated" with each droplet, as previously discussed in section 1 on page 2 of the 11/21/2005 action, has merely been rearranged. To reiterate and paraphrase, "a unit volume" generally means that the same "unit" (whatever it is) is used for all volume measurements, however as phrase by applicants claims, each and every droplet can be measured by an entirely different unit, such that calling it a unit volume is entirely meaningless, where every single droplet applied can be the same or radically size different, so as to essentially read on any size of droplets ever applied to anything. Note is presently claimed "a subset of said plurality of droplets" is just an arbitrary division with no distinguishing features. Nor does the description of the "spacing" have any determinable features, since "a function of a smallest unit volume possible for said subset" could mean anything in as the function is not defined (i.e. has infinite possibilities), the requirement of "possible for" is not something that is positively used & cannot be determined without knowing characteristics of liquid and equipment being used to form droplets with their "unit volumes", smallest or otherwise. This claim is either so broad or so vague as to be meaningless. Independent claims 11 & 21, which share the phrasing of claim 1, also have analogous problems.

Claims 2 & 13 continue to merely provide a definition of unit volume, assuming that "each of the remaining droplets..." means all the other droplets, such that it could be said to override the language that contradicts the use of unit volume in the first place, but it does not clarify what was intended by the contradictory language, either before or after amendment. With respect claim 1, the dependent claim 2 does not clarify the unclear language with respect to the spacings between droplets, since the smallest

Art Unit: 1762

possible volume is not necessarily used, and the function used to derive the spacing remains unknown. Claims 12 & 22 dependent from claims 11 & 21, add the uncertain language of claim 1, for equivalent confusion.

With respect claim 4, adding "a step of" before "spreading said droplets..." did not add any substance or explanation to the limitations therein. When the spreading and flowing and prevention of trapping of gases in the liquid remains uncertain specifically, as claim these actions could be occurring at any time (this could merely be considered broad), such that the steps could be referring to the flow of droplets on their way to a substrate, as it is noted that spreading can be considered to be affecting the distribution or the frequency of the dispensing of liquid droplets, which is a description of its flow. Alternately, applicants could be intending to refer to spreading of droplets after they are disposed on the substrate. Given that nothing in particular is ever done with these droplets, the claim could even be referring to what is done with droplets after they are poured off substrate, etc.....

While the amendments to claims 9, 15 & 23, do not clarify when the gas is present proximate to the droplets, such as during the further claimed "step of compressing...", at least in these claims, the further limitation fits into the sequence of steps in the independent claims due to the configuration of substrate, droplets & patterned body/template. Mere listing of two unassociated limitations in a dependent claim, does not supply any necessary at association between those separate limitations, unless language supplying a relationship is also present. Applicant's arguments imply that they clearly mean or intend something that they have not actually positively claimed, thus confusion on the clear intent of the claims remains.

Claims 5, 16 & 24 remained confusing as discussed on page 2 in section 1 of the 11/21/2005 action as the phrasing concerning the directions remains ambiguous. Since compression or compressing of something generally means that one presses down on it, thus when one compresses droplets on a substrate and calls that a first direction, a logical assumption from the claim language is that one is

Art Unit: 1762

pressing down or towards the substrate. Hence, to change the direction so it is transverse to the first direction of compression, for the remaining droplets is problematical, unless of course the substrate is not planar then one can compress the droplets in another direction against something else, or one can scrape them off (may or may not constitute compression). As this seems sort of silly, the examiner's other guess, is that applicants intend some non-idiomatic English usage of the words compressing, plus first and second direction.

In claims 7, how does a species of "a wafer" differ from the species of patterned or unpatterned templates, as the wafer would appear to be generic to both, and broader than either, as there is nothing to exclude it from acting as a template, just because one calls it a wafer, and wafers can be patterned or not.

In claims 10, 18 & 26 "complementary" will be considered sufficiently defined, as the claims' terminology can be considered to be defined by the relationship of the substrate and the superimposed patterned body, plus the formation of the contiguous layer in causing the formation of the "complementary" pattern in the layer on the substrate, but will be considered to be inclusive of any patterning that can be derived from such a configuration, as no possible outcomes are excluded by the modifier "complementary".

Claim 26 still contains the probable typographical error in its line 4 of "...layer to for said pattern", instead of ----to form said pattern--.

With respect to claims 19-20 & 27-28, it remains unclear how a "electromagnetic field", which is inclusive of light, electric fields & magnetic fields, can affect the movement/conformation of unspecified liquid materials which have no necessary means of interacting with the claimed electromagnetic fields in any way that will necessarily cause their movement or conformation with patterns as required, hence the intended scope of these claims remains unclear, lacking some necessary means of interaction with the generic class of electromagnetic fields.

Art Unit: 1762

2. The correction of figure 7 is acceptable to the examiner, appearing to correct previously noted omissions/problems.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the

Art Unit: 1762

conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-2, 4-6 & 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donges (6,234,379 B1), and on as discussed in section 5 of the 11/21/2005 rejection.

To reiterate, Donges teaches depositing individual droplets in a pattern, where they may be singly deposited at a location & the pattern is configured to minimize or eliminate voids & air pockets between the substrate & the flip chip, which is pressed down on it consequently spreading the deposited droplets. Note as illustrated & discussed, this would produce a contiguous layer. Donges doesn't discuss minimizing the travel distance or volume, but context suggests uniform size droplets, and minimizing both void & excess deposit so it won't squeeze out, would have suggested to one of ordinary skill the use of a pattern that has relatively uniformly spaced droplets in order to achieve both effects, which would in turn have the effect of minimizing travel distances as claimed, such that to do so would have been obvious, as well is entirely consistent with the claims as written & their possible decipherable meanings. In Donges, see the abstract; figures; summary; col.4, lines 1-15; col.5, lines 5-16 & 48-61; & claims.

It is noted that unless a process is done in absolute vacuum, there will always be gas proximate to droplets at all times during the deposition process, & that minimizing voids is equivalent to preventing entrapment of gas. Note that while Donges does not discuss droplets spacing in terms of an unknown function that uses an unspecifiable/unknowable unit volume to determine spacings to minimize voids & excess deposits, that they consider avoiding these effects implies that they knowingly arranged the distribution of their droplets to avoid these undesirable consequences, in any arrangement that they used with inherently have been based on the size of their droplets. One of ordinary skill would conclude from the disclosure of Donges, that a competent practitioner would have been expected to be capable through routine experimentation of devising appropriate droplet distribution/spacing & the like.

Art Unit: 1762

5. Claims 1-18 & 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nebashi et al (6,646,662 B1), as discussed in section 6 of the 11/21/2005 rejection.

To reiterate, Nebashi et al teach using a template (a patterned body) that delivers coating material in a pattern, where the delivery as illustrated in fig.10 may be by spaced apart drops, with pressure from the pressure chamber of the template, and movement between substrate & template used to form a pattern as illustrated in fig.1, which has contiguous deposits & has a correspondence of the patterned template. Nebashi et al doesn't discuss minimizing the travel distance or volume, however the teachings on uniform patterning are suggestive of equal volume deposits & with the illustrated even spacing of droplets, may be considered suggestive of claimed minimizing, such that given these teachings, it would have been obvious to one of ordinary skill to arrange the droplet deposition pattern to most efficiently achieve the desired pattern, which would have effectively included the claimed minimizing. Note as Nebashi et al may adjust the volume of liquid or drops applied to suffice for patterning purposes as discussed in col.5, this suggest differential droplet sizes, and the difference can always be described by some function of an arbitrary unit volume, such that one will be greater than the other. Note that adjustability does not require it to be adjusted during use, but does suggest the expected controllability of the unit droplet size applied between adjustments, thus suggesting uniform droplet size therefore.

In Nebashi et al, see the abstract; fig.1-6 & 9-10; Summary, esp. col.2, lines 12-59; col.5, lines 25-col.7, line 30; & col.9, line 58-col.10, line 43.

6. Claims 19-20 & 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nebashi et al (6,646,662 B1) or Donges (6,234,379 B1) as applied to claim 1-18 & 21-26, as appropriate above, and further in view of Everaerts et al (5,817,376), as discussed in section 7 of the 11/21/2005 rejection.

Nebashi et al or Donges do not teach use of electromagnetic field in the spreading step of applied the droplets, however Everaerts et al teach that it is advantageous to employ electrostatic assistance to



Art Unit: 1762

alleviate air entrapment between "coating beads" and the substrate in continuous liquid coating processes, where the electrostatics can be used to move the coating bead, i.e. droplet, with coaters such as gravure, which would have recess patterns are also mentioned. Given primary reference teachings on minimizing void or uniform delivery/patterning of liquid drops, it would have been obvious to one of ordinary skill in the art to employ electrostatics in positioning droplets for advantages as suggested by Everaerts et al, as the alleviation of air entrapment is consistent with desires of either Nebashi et al or Donges & analogous as both employ liquid coating techniques that could be used in a continuous manufacturing environment. With respect to Donges, especially note that avoiding formation of voids is especially complementary to using a technique, which alleviates air entrapment, thus providing further motivation for combination therewith. In Everaerts et al, see the abstract; col.1, line 44-col.2, line 19; & col.5, lines 19-55.

7. Claims 1-2, 4-13 & 15-18 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10-14 of U.S. Patent No. 6,929,762 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other as discussed in section 8 of the 11/21/2005 rejection, because their narrower focus encompassed the broader limitations of the present claims, especially considering the uncertainty of many features in the present claims, as well as previously discussed inherent meanings or using equivalent terminology.

Note while there are no overlapping inventors, the assignee is the same, hence since the filing date is before that of the present case, the following 103 rejection is also required unless appropriate showings are provided.

8. Claims 1-2, 4-13 & 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubin et al as discussed above in section 7 & section 8 of the 11/21/2005 rejection.

9. Claims 1-2, 4-13 & 15-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 150-156, 165-171, 174-175, 178-179 of copending Application No. 09/908,455. Although the conflicting claims are not identical, they are

Art Unit: 1762

not patentably distinct from each other because reasons analogous to those of section 7 above & section 8 of the 11/21/2005 rejection.

It is noted that the independent claims in this case (455) have been amended to require the presence of an ambient containing gases, which is consistent with possible meaning of claims in this application (455), such as claims 4, or 9, or 15, thus provides no differentiation. The independent claims of this application (455) have been amended, such that the liquid is now disposed in a pattern, which is more generic than the previously claimed "as a plurality of spaced apart droplets", however there are still dependent claims that define the pattern as being composed of "a plurality of spaced apart droplets", hence the two sets of claims in these applications remain of overlapping scopes as previously discussed.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1-2, 4-13 & 15-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 6, 8-10 & 15-28 of copending Application No. 10/143,092. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are not patentably distinct from each other because reasons analogous to those of section 7 above & section 8 of the 11/21/2005 rejection.

It is noted that there has been no change in the claims in this application since the last rejection.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Claims 3, 14 & 19-28 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims as applied above of copending Application No. 10/143,092 or 09/908,455 in view of Nebashi et al (6,646,662 B1) in view of Everaerts et al (5,817,376), as applied above & section 7 of the 11/21/2005 rejection, noting the difference in these use claims is the lack of different size drops & use of electromagnetics for spreading.

Art Unit: 1762

This is a provisional obviousness-type double patenting rejection.

12. Claims 3, 14 & 19-28 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10-14 of U.S. Patent No. 6,929,762 in view of Nebashi et al (6,646,662 B1) in view of Everaerts et al (5,817,376), as applied above & section 7 of the 11/21/2005 rejection, noting the difference in these use claims is the lack of different size drops & use of electromagnetics for spreading.

13. Applicant's arguments filed 4/21/2006 & discussed above have been fully considered but they are not persuasive.

Note that limitations that provide no clear meaning as to size of droplets, nor spacing thereof, can add no clear distinction from any other process. None of applicants' independent claims require any particular size or spacing for applied droplets, they merely unclearly require just about any size may be used, in any distribution based on an unstated function, thus cannot distinguish over the applied art. Furthermore, the examiner notes that any droplet dispensing machine that is to be used for pattern deposition, would have been expected to be chosen for its ability to reproducibly produce droplets in a size consistent with the resolution desired to be produced, as any competent practitioner would know that one cannot reproducibly and effectively produce pattern resolution without control of patterned droplet deposition. This is so basic that one of ordinary skill in the art would not necessarily expect there to be any need to discuss that the droplets used were of essentially the same size, where spacing between them would have been expected to be essentially controlled according to desired pattern deposition, i.e. areas of like density of deposit would have been expected to have like spacings between like droplets. This is a matter of basic geometry and common sense, not patentable significance.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

Art Unit: 1762

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MLP/dictation software

7/10/2006



MARIANNE PADGETT  
PRIMARY EXAMINER